LISTING OF CLAIMS

The listing of claims below will replace all prior versions and listings of claims in the present application.

Claim Listing

1	1. (Original) A method comprising:
2	receiving a request to load a device policy module into a memory, wherein the
3	device policy module is for use by a device driver, and wherein the device
4	policy module includes at least one of a function, a procedure, and an
5	object-oriented method operable to perform at least one of input/output
6	(I/O) operation scheduling, path selection, and I/O operation error
7	analysis;
8	loading the device policy module into the memory; and
9	informing the device driver of availability of the device policy module.
1	2. (Original) The method of claim 1 wherein the request to load a device policy
2	module into a memory is received form at least one of a user application and a device
3	discovery application.
1	3. (Original) The method of claim 1 wherein a portion of the memory comprises
2	a kernel memory space, and wherein the loading the device policy module into the
3	memory further comprises:
4	loading the device policy module into the kernel memory space.
1	4. (Original) The method of claim 1 wherein the informing the device driver of
2	availability of the device policy module further comprises:
3	registering the device policy module with the device driver by calling at least one
4	of a function, a procedure, and an object-oriented method associated with
5	the device driver.

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1	5. (Original) The method of claim 1 further comprising:
2	determining whether the device policy module is currently present in the memory.
1	6. (Original) The method of claim 1 further comprising:
2	informing the device driver of unavailability of the device policy module.
1	7. (Original) The method of claim 6 wherein the informing the device driver of
2	unavailability of the device policy module further comprises:
3	unregistering the device policy module with the device driver by calling at least
4	one of a function, a procedure, and an object-oriented method associated
5	with the device driver.
1	8. (Original) The method of claim 1 wherein the device policy module is for use
2	with a corresponding storage device, the method further comprising:
3	transmitting at least one storage device attribute to the device driver.
1	9. (Original) The method of claim 1 wherein the at least one of a function, a
2	procedure, and an object-oriented method of the device policy module is specific to a
3	particular storage device.
1	10. (Original) The method of claim 1 wherein the at least one of a function, a
2	procedure, and an object-oriented method operable to perform at least one of I/O
3	operation scheduling, path selection, and I/O operation error analysis performs at least
4	one of:
5	selecting one of a plurality of communication pathways to at least one storage
6	device;
7	selecting one or more sub-devices of the at least one storage device which will be
8	affected due to a communication pathway failure;
9	selecting an alternate communication pathway in case of a failure of one of the
10	plurality of communication pathways;

11	changing a current communications pathway from a first one of the plurality of
12	communication pathways to a second one of the plurality of
13	communication pathways;
14	responding to SCSI reservation/release requests; and
15	selectively transmitting I/O operations along at least two of the plurality of
16	communication pathways to the at least one storage device.
1	11. (Original) The method of claim 1 further comprising:
2	monitoring operation of the device policy module.
1	12. (Original) The method of claim 1 further comprising:
2	discovering the presence of at least one storage device belonging to a distributed
3	computing system.
1	13. (Original) The method of claim 12 further comprising:
2	determining whether the at least one storage device has a corresponding device
3	policy module.
1	14. (Original) A system comprising:
2	a storage device discovery module configured to determine information about at
3	least one storage device belonging to a distributed computing system; and
4	a multipath driver in communication with the storage device discovery module
5	and configured to direct input/output (I/O) operations along at least one of
6	a plurality of communication pathways to the at least one storage device,
7	the multipath driver including:
8	an interface configured to communicate with a device policy module
9	including at least one of a function, a procedure, and an object-
10	oriented method operable to perform at least one of I/O operation
11	scheduling, path selection, and I/O operation error analysis.

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1	15. (Original) The system of claim 14 further comprising:
2	a device policy module including at least one of a function, a procedure, and an
3	object-oriented method operable to perform at least one of I/O operation
4	scheduling, path selection, and I/O operation error analysis.
1	16. (Original) The system of claim 15 wherein the at least one of a function, a
2	procedure, and an object-oriented method of the device policy module is specific to a
3	particular storage device.
1	17. (Original) The system of claim 14 wherein the at least one of a function, a
2	procedure, and an object-oriented method operable to perform at least one of I/O
3	operation scheduling, path selection, and I/O operation error analysis performs at least
4	one of:
5	select one of the plurality of communication pathways to the at least one storage
6	device;
7	select one or more sub-devices of the at least one storage device which will be
8	affected due to a communication pathway failure;
9	select an alternate communication pathway in case of a failure of one of the
10	plurality of communication pathways;
11	effect a communications pathway changeover;
12	respond to respond to SCSI reservation/release requests; and
13	selectively transmit I/O operations along at least two of the plurality of
14	communication pathways to the at least one storage device.
1	18. (Original) The system of claim 17 wherein the at least one storage device is a
2	disk array and wherein the one or more sub-devices are disk drives.
1	19. (Original) The system of claim 14 further comprising:
2	a memory; and

3	a processor coupled to the memory, wherein at least one of the storage device
4	discovery module and multipath driver are encoded as instructions stored
5	in the memory and executable on the processor.
1	20. (Original) The system of claim 19 wherein a first portion of the memory is
2	used as a kernel memory space and wherein a second portion of the memory is used as a
3	user memory space, and wherein the multipath driver is stored in the kernel memory
4	space.
1	21. (Original) The system of claim 14 wherein the multipath driver further
2	comprises:
3	a fixed set of I/O policies including at least one of a function, a procedure, and an
4	object-oriented method operable to perform at least one of I/O operation
5	scheduling, path selection, and I/O operation error analysis.
1	22. (Original) The system of claim 14 wherein the interface configured to
2	communicate with a device policy module includes at least one of a function, a
3	procedure, and an object-oriented method operable to perform at least one of registering a
4	device policy module with the multipath driver and unregistering a device policy module
5	with the multipath driver.
1	23. (Original) The system of claim 14 wherein the multipath driver is further
2	configured to monitor at least one loaded device policy module.
1	24. (Original) The system of claim 14 wherein the multipath driver is further
2	configured to receive at least one of a request to load a device policy module and a
3	request to unload a device policy module.
1	25. (Original) The system of claim 14 wherein the information about at least one
2	storage device includes at least one device attribute and wherein the device discovery
3	module is further configured to transmit the information about at least one storage device
4	to the multipath driver.

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1	26. (Original) The system of claim 25 wherein the at least one device attribute
2	includes at least one of: a number of paths to the device, primary path information,
3	secondary path information, connected path information, disconnected path information,
4	vendor information, an enclosure serial number, and an LUN serial number, an array
5	type.
1	27. (Original) The system of claim 14 wherein the storage device discovery
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2	module is further configured to transmit the information about at least one storage device
3	to the multipath driver.
1	28. (Original) The system of claim 14 wherein the storage device discovery
2	module is further configured to receive at least one of a request to load a device policy
3	module and a request to unload a device policy module.
1	29. (Original) A computer readable medium comprising program instructions
2	executable on a processor, the computer readable medium being at least one of an
3	electronic storage medium, a magnetic storage medium, an optical storage medium, and a
4	communications medium conveying signals encoding the instructions, wherein the
5	program instructions are operable to implement each of:
6	receiving a request to load a device policy module into a memory, wherein the
7	device policy module is for use by a device driver, and wherein the device
8	policy module includes at least one of a function, a procedure, and an
9	object-oriented method operable to perform at least one of input/output
10	(I/O) operation scheduling, path selection, and I/O operation error
11	analysis;
12	loading the device policy module into the memory; and
13	registering the device policy module with the device driver.
1	30. (Original) The computer readable medium of claim 29 wherein the request to
2	load a device policy module into a memory is received form at least one of a user
3	application and a device discovery application.
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1	31. (Original) The computer readable medium of claim 29 wherein a portion of
2	the memory comprises a kernel memory space, and wherein the program instructions
3	operable to implement the loading the device policy module into the memory further
4	comprise program instructions operable to implement:
5	loading the device policy module into the kernel memory space.
1	32. (Original) The computer readable medium of claim 29 wherein the program
2	instructions operable to implement the registering the device policy module with the
3	device driver further comprise program instructions operable to implement:
4	calling at least one of a function, a procedure, and an object-oriented method
5	associated with the device driver.
1	33. (Original) The computer readable medium of claim 29 further comprising
2	program instructions operable to implement:
3	determining whether the device policy module is currently present in the memory.
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1	34. (Original) The computer readable medium of claim 29 wherein the at least
2	one of a function, a procedure, and an object-oriented method of the device policy
3	module is specific to a particular storage device.
1	35. (Original) The computer readable medium of claim 29 wherein the at least
1	
2	one of a function, a procedure, and an object-oriented method operable to perform at least one of I/O operation scheduling, path selection, and I/O operation error analysis
3	
4	comprises program instructions operable to perform at least one of:
5	selecting one of a plurality of communication pathways to at least one storage
6	device;
7	selecting one or more sub-devices of the at least one storage device which will be
8	affected due to a communication pathway failure;
9	selecting an alternate communication pathway in case of a failure of one of the
10	plurality of communication pathways;

11	changing a current communications pathway from a first one of the plurality of
12	communication pathways to a second one of the plurality of
13	communication pathways;
14	responding to SCSI reservation/release requests; and
15	selectively transmitting I/O operations along at least two of the plurality of
16	communication pathways to the at least one storage device.
1	36. (Original) The computer readable medium of claim 29 further comprising
2	program instructions operable to implement:
3	monitoring operation of the device policy module.
	37-40. (Cancelled)

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